

AMENDMENT
U.S. Appln. No. 10/608,778

REMARKS

Claims 1-57 are all the claims pending in the application.

Claim 11 has been amended in accordance with, for example, the disclosure at paragraph [0188] as well as FIGS. 1 and 13.

Claims 40 and 43 have been amended in accordance with, for example, FIGS. 32-37 and the description at paragraphs [0100] to [0118].

In amended FIGS. 14(A) and 14(B), the caption "Prior Art" has been added.

No new matter has been added.

Applicants note with appreciation the Examiner's indication of allowable subject matter at Section Nos. 12 and 13 (pages 6 and 7) of the Office Action.

Referring to Section No. 3 at page 2 of the Office Action, the Examiner has objected to Claim 40. According to the Examiner, "release film" should be "adhesive layer" in line 7.

Line 7 of Claim 40 has been amended as requested by the Examiner. Withdrawal of the objection is requested.

Referring to Section No. 5 at page 2 of the Office Action, Claims 40-43 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. According to the Examiner, Claims 40 and 43 recite "a step of separating a selvedge," but neither claim recites a step of forming a selvedge relative to the inner portion such that the inner portion and selvedge can be separated from each other.

Amended Claims 40 and 43 satisfy each and every requirement of §112. Reconsideration and withdrawal of the §112 rejection of Claims 40-43 is requested. Furthermore, Claims 40-43 should now be in condition for allowance. As stated at Section Nos. 12 and 13 (pages 6 and 7) of the Office Action. Specifically, Claims 40-43 will be allowable once the rejection under 35 U.S.C. § 112, second paragraph, is overcome and once, with respect to Claim 40, the objection is overcome.

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Referring to Section No. 7 at page 3 of the Office Action, Claim 32 is rejected under 35 U.S.C. § 102(b) as being anticipated by JP 55-117110 (“JP ‘110”).

Applicants respectfully traverse.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987); MPEP §2131. The identical invention must be shown in as complete detail as is contained in the claim. Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

The method for bonding a polarizing plate according to Claim 32 includes a step of severing a strip-shaped film after a step of bonding the strip-shaped film to a substrate.

In contrast, FIGS. 1 and 2 of JP ‘110 show an adhesive polarizing plate wherein a polarizing film 4 and an adhesive agent 5 have been already cut. Applicants refer to lines 3-19 at the upper left column of page 3 of JP ‘110. Thus, the method for bonding a polarizing plate in JP ‘110 does not include a step of severing the polarizing film 4 after a step of bonding the adhesive polarizing plate to a cell. Applicants refer to line 3 at the upper right column of page 3 through line 9 at the lower left column of page 3.

Thus, JP ‘110 does not disclose each and every element of the method of Claim 32 as required by §102. Reconsideration and withdrawal of the §102(b) rejection of Claim 32 is requested.

Referring to Section No. 9 at page 4 of the Office Action, Claims 11-14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 8-87007 (“JP ‘007”).

Applicants respectfully traverse.

For the Examiner’s convenience, Applicants point out that U.S. Patent No. 5,667,624 (“US ‘624”) is an English-language counterpart of JP ‘007.

Claim 11 is an independent claim, and each of Claims 12-14 depends from Claim 11. Thus, Applicants’ comments below focus on independent Claim 11.

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Claim 11 recites that the step of bonding a tacky surface of the film piece freed of the release film to a mating position of the substrate, so that a forward end side end face of the transported substrate is parallel to the pre-severed end face of the film piece, is undertaken while the film piece and the substrate are moved to the same direction so that the supply of the film piece is synchronized with the transport of the substrate.

JP '007 does not teach or suggest at least the above bonding step of Claim 11.

Instead, JP '007 teaches an apparatus for bonding a polarizing plate. Referring to the column and line numbers from counterpart US '624, the separating process of JP '007 is taught at column 5, line 22, through column 6, line 20, and the bonding step of JP '007 is taught at column 6, line 65, through 7, line 15. Thus, in JP '007, the cut polarizing plate 52 is sucked by a head 58, lifted, transferred and bonded to a cell 30.

In view of the foregoing, Applicants request reconsideration and withdrawal of the §103 rejection of Claims 11-14.

Referring to Section No. 10 at pages 4 and 5 of the Office Action, Claims 11 and 13-14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 1-260417 ("JP '417").

Applicants respectfully traverse.

The process for bonding a polarizing plate taught by JP '417 is similar to the process taught by JP '007. Referring to FIG. 2 in JP '417, a cut ("single") polarizing plate 29 is released from a separator 18 by transporting a clip head 31, sucked up by a head (air chuck) 34 and transferred to a stage 35 by the head 34 for bonding and then bonded onto a liquid crystal display 37. In particular, the sucking head (air chuck) 34 sucks (separates) the cut "single" polarizing plate 29 to release (peel) from the separator (separator base film), and the separated "single" polarizing plate 29 is transferred to the stage 35 by the sucking head (air chuck) 34 to be placed and bonded on the liquid crystal display 37.

In contrast, the present invention does not use the transferring head (transferring head of air chuck).

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As for present Claim 13, the film piece is supplied (or positioned) to the site for bonding to the substrate without using the transferring head.

With respect to present Claim 14, in JP '417, the polarizing plate is supplied from the upper side and bonded onto the up-side of the display element. However, according to present Claim 14, it is supplied from the bottom side and bonded onto the substrate, i.e., conversely to the case of JP '417.

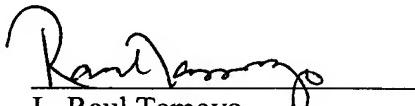
In view of the foregoing, Applicants request reconsideration and withdrawal of the §103 rejection of Claims 11 and 13-14.

For the Examiner's convenience, Applicants are submitting herewith a machine-generated translation of JP-A-H08-50290.

Reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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JP-A-H08-50290 translated by machine

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] On the other hand, the pasting approach of the polarizing plate characterized by to push a polarizing plate against the body of a panel, to obtain it, and to stick it by the adhesive layer from the part which exfoliated, the body of a panel of a liquid crystal display panel being set, and a polarizing plate turning down the mold releasing film currently stuck possible [exfoliation] by the adhesive layer, being set, moving a polarizing plate toward a predetermined attachment location on the other hand, and exfoliating a mold releasing film in an attachment location.

[Claim 2] In the pasting equipment which sticks a polarizing plate on the whole surface side of the body of a panel of a liquid crystal display panel The panel receptacle device section which turns a whole surface side up and holds the body of a panel on a table, Have the delivery belt which rotates toward an attachment location, and support the polarizing plate with which this delivery belt stuck the mold releasing film on that top-face adhesive face on the inferior surface of tongue by adhering a mold releasing film, and it conveys. While carrying out migration regulation of the polarizing plate which stuck the mold releasing film with the delivery belt in the attachment location with the pasting device section torn off with a delivery belt from the polarizing plate by which migration regulation was carried out, and has been conveyed to a location Pasting equipment of the polarizing plate characterized by equipping the body of a panel with a ***** means after turning the exfoliation part for the polarizing plate under mold releasing film exfoliation down.

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[Detailed Description of the Invention]**[0001]**

[Industrial Application] This invention is the phase of the production process of the liquid crystal display panel which consists of a liquid crystal cell etc., and relates to the pasting approach of exfoliating a mold releasing film and sticking a polarizing plate on the body of a panel, and its equipment.

[0002]

[Description of the Prior Art] Generally, a liquid crystal display panel (it is only hereafter called a panel) encloses liquid crystal with the opening of the liquid crystal cell constituted by preparing an opening between two glass substrates, and has the composition of having prepared the polarizing plate outside, respectively, in two glass substrates. A commercial polarizing plate is usually a film-like, it covers a protection film on the external surface of the polarization film which mainly polarizes light, applies adhesives to an inside, and is the laminate which stuck the mold releasing film on the adhesion side of the adhesives. If it is in mass production Rhine of a liquid crystal display device, the mold releasing film of a polarizing plate is exfoliated beforehand, and the adhesion side of adhesives is exposed, and the process which a polarizing plate is stuck [process] on a glass substrate at an external surface side, and arranges the adhesion side is included. Drawing 4 - drawing 6 show the pasting approach of the polarizing plate commonly used from the former, and an example of equipment. Equipment makes the principal part the panel receptacle device section 1 which supports the body 2 of a panel and stands by, and the pasting device section 3 which supports a polarizing plate 4 and stands by. The polarizing plate 4 used as adhesive layer 4a which the field which exfoliated the mold releasing film 5 becomes from adhesives is beforehand stuck on the body 2 (glass substrate) of a panel by the coordinated drive of both the devices sections 1 and 3 through the procedure which exfoliates a mold releasing film 5 from a polarizing plate 4. As shown in drawing 4, in the panel receptacle device section 1, the adhesion roller 7 is contacted to the whole surface side of the body 2 of a panel positioned and set on the table 6, and, specifically, it cleans. Cleaning with this adhesion roller 7 is performed through the hand of those who have been stationed in Rhine. On the other hand, it positions on a table 8, a mold releasing film 5 is exfoliated from the polarizing plate 4 set by making public the field by the side of a mold releasing film 5, and it is made to stand by in preparation for pasting actuation in the pasting device section 3. Exfoliation of this mold releasing film 5 is performed through a help. After finishing such preparation, reversal actuation of the whole pasting device section 8 is carried out towards the panel receptacle device

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section 1 through the rotation supporting point. If the pasting device section 3 is reversed the whole table 8 where a polarizing plate 4 is held, the edge of adhesive layer 4a of the reversed polarizing plate 4 opposite** like drawing 5 at the edge of the body 2 of a panel on the panel receptacle device section 1. In this condition, the press roller 9 formed in the pasting device section 3 side moves in the direction forced on the edge of the body 2 of a panel in the edge of adhesive layer 4a of a polarizing plate 4, and the panel receptacle device section 1 whole moves leftward [of drawing] synchronous at this. And as shown in drawing 6, while a polarizing plate 4 is torn off from the table 8 holding it in coordinated actuation with the forcing migration with the press roller 9, and migration of the panel receptacle device section 1, it is stuck on the body 2 of a panel at a whole surface side that adhesive layer 4a is also. Then, it is reversed in the direction of origin, and the pasting device section 3 returns to the location of drawing 4.

[0003]

[Problem(s) to be Solved by the Invention] By the way, with the polarizing plate pasting approach and equipment from such the former, as mentioned above, the adhesion roller 7 cleans the whole surface side of the body 2 of a panel in the phase of preparation, or the activity which exfoliates a mold releasing film 5 is altogether done through the help from the polarizing plate 4. Therefore, the production efficiency at the time of mass production is low, and dust and a foreign matter are generated from the body etc. during an activity. By sticking, after being easy to adhere to adhesive layer 4a of the polarizing plate 4 with which these exfoliated the mold releasing film 5 and exposing all adhesive layer 4a of a polarizing plate 4, or using exposed adhesive layer 4a as the front face Dust etc. adhered to adhesive layer 4a, quality deteriorated, and it had become the cause of the cost quantity by yield fall. Therefore, the purpose of this invention is by automating the pasting process of a polarizing plate in the production process of liquid crystal display DEPANERU to offer the pasting approach of the polarizing plate which can raise quality and productivity, and its equipment.

[0004]

[Means for Solving the Problem] The body of a panel of a liquid crystal display panel is set by one side, on the other hand, a polarizing plate turns down the mold releasing film currently stuck possible [exfoliation by the adhesive layer], is set, and moves a polarizing plate toward a predetermined attachment location, and the pasting approach according to invention according to claim 1 in order to attain this purpose pushes a polarizing plate against the body of a panel, and sticks it by the adhesive layer in an attachment location from the part which exfoliated, exfoliating a mold releasing film. Like claim 2 publication, moreover, the pasting equipment of this invention It is what

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sticks a polarizing plate on the whole surface side of the body of a panel of a liquid crystal display panel. The panel receptacle device section which moves to the location on which a whole surface side is turned up, the body of a panel is held on a table, and predetermined sticks it. Have the delivery belt which rotates toward an attachment location, and support the polarizing plate with which this delivery belt stuck the mold releasing film on that top-face adhesive face on the inferior surface of tongue by adhering a mold releasing film, and it conveys. While carrying out migration regulation of the polarizing plate which stuck the mold releasing film with the delivery belt in the attachment location with the pasting device section torn off with a delivery belt from the polarizing plate by which migration regulation was carried out, and has been conveyed to a location After turning an exfoliation part for the polarizing plate under mold releasing film exfoliation down, the ***** means is constituted in preparation for the body of a panel.

[0005]

[Function] By the pasting approach according to claim 1, the mold releasing film joined by the adhesive layer is turned down, and a polarizing plate is set. It sticks in an attachment location, pushing a polarizing plate against the body of a panel by the adhesive layer from the part which exfoliated, exfoliating a mold releasing film. During exfoliation of a mold releasing film, the time amount which moreover touches work environment downward also comes out of the adhesive layer of a polarizing plate only, and, for a certain reason, adhesion of a foreign matter stops at the minimum. Moreover, the migration is regulated with a press means and the polarizing plate which stuck with the delivery belt and has been conveyed to a location with pasting equipment according to claim 2 is ***** from an exfoliation part to the body of a panel about the polarizing plate under exfoliation of a mold releasing film. Exfoliation of a mold releasing film makes a mold releasing film adhere to the adhesive face of a delivery belt, and is automatically torn off by migration of a delivery belt using this adhesion.

[0006]

[Example] Hereafter, the pasting approach of the polarizing plate by this invention and one example of that equipment are explained based on a drawing. As the important section of the equipment by the example is shown in drawing 1 The cleaning means 20 which consists of an adhesion roller which is held on the panel receptacle device section 10 which turns a whole surface side up, holds it on a table 11, and moves the body 12 of a panel to a predetermined attachment location, and this panel receptacle device section 10, and carries out automatic cleaning of the whole surface side of the waiting body 12 of a panel (21). Have the delivery belt 35 which rotates toward an attachment location,

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and this delivery belt 35 has adhesiveness on one side. It conveys supporting a polarizing plate 40 by turning a mold releasing film 41 down and adhering it to the adhesive face. While carrying out migration regulation of the polarizing plate 40 which stuck the mold releasing film 41 in the attachment location from the polarizing plate 40 by which migration regulation was carried out with the pasting device section 30 and the delivery belt 35 which are torn off with the delivery belt 35, and has been conveyed to a location. It consists of press means 22 grade which pushes the polarizing plate 40 under mold releasing film exfoliation against the body 12 of a panel, and sticks it from an exfoliation part.

[0007] In drawing 1, the panel receptacle device section 10 is equipped as one of the important sections of equipment, and the table 11 in which the reciprocation (it sticking and uniting from a original location and being between the distance to a location) through which it passes horizontally (A, D) by right and left of drawing is possible is arranged here. On this table 11, one body 12 of a panel of an attachment object is supported by positioning. The liquid crystal cell which has a liquid crystal enclosure opening is pointed out between two glass substrates in the body 12 of a panel here. Moreover, the foreign matter cleaning rollers 20 and 21 of the automatic cleaning means as used in the field of this invention being arranged near the table 11 in a original location, carrying out automatic control of that actuation, and rotating the top face which is a pasting side of the body 12 of a panel, the dust and foreign matter adhering to a top face are made to stick, and it can remove.

[0008] Moreover, the pasting device section 30 is equipped as one of the important sections of equipment, it **** here, the side roller 31 and the rolling-up side roller 32 are supported respectively free [rotation], and two or more middle tension rollers 33 and 34 are arranged between both the rollers 31 and 32. Among these rollers, the adhesion belt 35 by a Scotch tape etc. is wound rotatable in the directions B and C of an arrow head as a delivery belt as used in the field of this invention. One side of the adhesion belt 35 is formed in the adhesive face, holds a polarizing plate 40 to this adhesive face (the mold releasing film 41 before exfoliation is turned down, and it is made to adhere to an adhesive face), and conveys it to a predetermined attachment location. Moreover, a certain wedge-shaped guide member 36 is arranged also for the duty which is the magnitude which can hold a polarizing plate 40, and gives a tension to a belt in the proper place of the wound adhesion belt 35. In order to show the point of the guide member 36 to smooth rotation of the adhesion belt 35, the pinch roller guide-idler 37 grade is supported to revolve to rotation freedom, and the ***** belt 35 places an adhesive face upside down centering on a guide idler 37, and is changing [B]

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the travelling direction in the direction C of an arrow head from the arrow head.

[0009] the polarizing plate 40 stick on the above mentioned body 12 of a panel here have the linearly polarized light or the operation which carry out elliptically polarized light in incident light , it have flexibility to external force , and it be crook moderately , and generally , the mold releasing film 41 remove by exfoliate be stick on an adhesive layer 42 (refer to below drawing 2) at the time of use , and it be set to the top face which be an adhesive face of the adhesion belt 35 in the correspondence part on the guide member 36 . A polarizing plate 40 turns the mold releasing film 41 before exfoliation down, namely, turns an adhesive layer 42 down, makes this mold releasing film 41 adhere to the top face of the adhesion belt 35, and is set.

[0010] Moreover, the press roller 22 which is the press means as used in the field of [the mid-position] this invention of the above panel receptacle device sections 10 and the pasting device section 30 mostly is arranged. The location where the press roller 22 has been arranged can be made into a "predetermined attachment location" top. [which was described until now] The migration on the four directions shown in drawing 2 and drawing 3 by actuation by automatic control from the original location shown by drawing 1 and jogging are possible for the press roller 22. The role of this press roller 22 has the function to push a polarizing plate 40 against the body 12 of a panel, and to stick it, to the body 12 of a panel and polarizing plate 40 which have moved to an attachment location so that it may be explained below.

[0011] Next, the pasting approach which used the pasting equipment by the above configuration, and its operation are explained. Like drawing 1 , on a table 11, the body 12 of a panel turns the pasting side up, and is set in the panel receptacle device section 10. On the other hand, a side also comes out of the pasting side of the polarizing plate 40 of the body 12 of a panel so only in addition to a whole surface side, and a certain thing is well known. If the completion of positioning of the body 12 of a panel is detected, it will be sent to the foreign matter cleaning rollers 20 and 21 by the active signal from a control unit. The foreign matter cleaning rollers 20 and 21 stick and remove the dust and foreign matter which had two incomes rotating and adhered to the top face of the body 12 of a panel. Cleaning is completed and a table 11 runs to a predetermined attachment location in the direction A of an arrow head toward the pasting device section 30 by the control based on the time or actuation detection.

[0012] Like drawing 2 , if the table 11 of the panel receptacle device section 10 arrives at a predetermined location, synchronizing with this, it **** with an active signal and the side roller 31 and the rolling-up side roller 32 rotate, respectively, it will let out the adhesion belt 35 in the directions B and C of an arrow head, and it will be rotated in the

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pasting device section 30. In connection with this, the polarizing plate 40 by which adhesion maintenance was carried out in the adhesive face of the adhesion belt 35 turns the adhesive layer 42 to the bottom, is guided at the wedge-shaped guide member 36, and carries out skew migration toward the body 12 of a panel which is standing by on the table 11 by the side of the panel receptacle device section 10. The timing of actuation in the meantime is measured and migration is started toward the point of the polarizing plate 40 which the press roller 22 is moving timely.

[0013] The press roller 22 is turned in the direction E of an arrow head, and presses the point of the polarizing plate 40 which has moved, and a polarizing plate 40 has the migration regulated. The mold releasing film 41 which has stuck to the adhesion belt 35 has stuck successingly, even if the adhesion belt 35 changes [B] the travelling direction in the direction C of an arrow head from an arrow head centering on a guide idler 37. On the other hand, a polarizing plate 40 moves toward the direction B of an arrow head, not being crooked according to the adhesion belt 35 and removing a mold releasing film 41 on the basis of a guide idler 37, in order that the direction C of an arrow head may displace [B] sharply from an arrow head.

[0014] As shown in drawing 3, to the timing of a mold releasing film 41 which synchronized with tearing off mostly, the press roller 22 presses a polarizing plate 40 on the top face of the body 12 of a panel from the point by which a mold releasing film 41 began to be torn off, and is stuck. Since are hard to deposit dust etc. and a mold releasing film 41 tears off, since the field of the polarizing plate 40 which exfoliated the mold releasing film 41 became an adhesive layer 42 and it has always turned [field] to the bottom, a ***** synchronization is carried out, and it is sticking, and the time amount which the adhesive layer 42 has exposed is short, dust etc. cannot adhere easily.

[0015] if attachment of a polarizing plate 40 is completed on the body 12 of a panel -- each device sections including the panel receptacle device section 10 -- it each retreats, and returns to the original location, and the new body 12 of a panel and a new polarizing plate 40 are set in each device section. Although neither of whether the set of the body 12 of a panel and a polarizing plate 40 is performed automatically or to be carried out through a help is mentioned in this example, of course, it is automatable. For the purpose of this invention, it is in improvement in the yield and a throughput by the automation and full automation of an activity which exfoliate a mold releasing film 41 from a polarizing plate 40 at the time of attachment. In addition, in the example mentioned above, as compared with the conventional example, the incidence rate of the defective by attachment could be reduced to the quadrant, and the throughput was able to be raised by about 4 times.

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[0016]

[Effect of the Invention] Since an approach which is slight is taken according to the pasting approach of the polarizing plate by this invention, and its equipment while exfoliating a mold releasing film automatically from a polarizing plate as explained above, since adhesion of a foreign matter remains in the minimum, it is quality and can mass-produce efficiently a liquid crystal display panel also with the good yield.

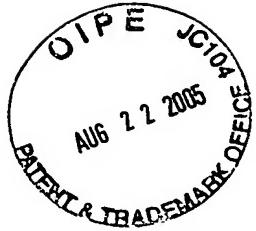
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AMENDMENTS TO THE DRAWINGS

The attached drawing sheet includes changes to FIGS. 14(A) and 14(B). The sheet replaces the original sheet (sheet 14 of 39) including FIGS. 14(A) and 14(B). In FIGS. 14(A) and 14(B), the caption "PRIOR ART" has been added.

Attachment: Annotated Sheet Showing Changes
Replacement Sheet



Appl. No. 10/608,778
Docket No. Q76358
Amdt. Dated August 22, 2005
Reply to Office action of April 21, 2005
Annotated marked-up Drawings

FIG.14(A) PRIOR ART

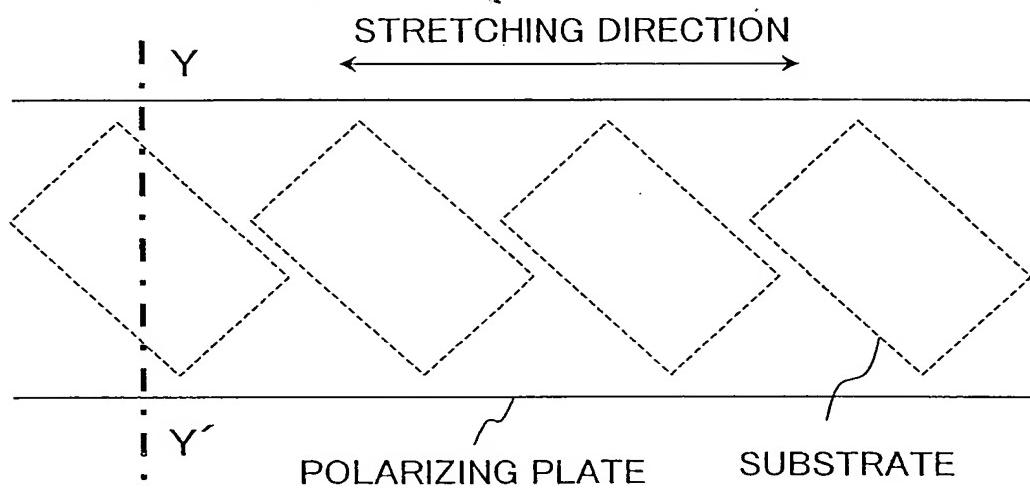


FIG.14(B) PRIOR ART

